



Interannual variability of the subpolar Atlantic and role of eddies: contribution of numerical models at increasing spatial resolution.

Anne Marie Treguier (1), Julie Deshayes (1), Raphael Dussin (2), and Jean-Marc Molines (2)

(1) CNRS, LPO (Laboratoire de Physique des Océans), IUEM, Plouzane, France , (2) CNRS, LEGI (Laboratoire des écoulements géophysiques et industriels), Grenoble, France

Observations have documented an important variability, interannual to decadal, in the North Atlantic subpolar gyre. The strength and the extent of the gyre circulation are variable, as well as water mass properties within the gyre, due to changes in the internal ocean dynamics as well as changes in the atmospheric forcings. Numerical simulations of the subpolar gyre reproduce this variability to some extent and are a useful tool to understand the underlying mechanisms. In this talk, we examine the recent variability (1990-2008) simulated by a suite of global and basin scale models at varying resolution (DRAKKAR project). In particular we evaluate the role of eddies in setting the current and thermohaline properties. In all models, there are deficiencies in the representation of water masses, especially in the Irminger Sea and Labrador Sea, and in the representation of boundary currents. Increasing the spatial resolution (up to $1/12^\circ$) does not systematically improve the model solutions, suggesting that the parameterizations of subgridscale processes will remain essential as the grids are refined in climate models.